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Louis H. Mayo

**CONSIDERATION OF ENVIRONMENTAL NOISE EFFECTS
IN TRANSPORTATION PLANNING
BY GOVERNMENTAL ENTITIES**

December 1972

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ENVIRONMENTAL NOISE EFFECTS IN
TRANSPORTATION PLANNING BY GOVERNMENTAL
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IN TRANSPORTATION PLANNING
BY GOVERNMENTAL ENTITIES

Professor Louis H. Mayo

December 1972

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- . Scientific Method, Adversary Process, and Technology Assessment (1969)
- . Legal-Jurisdictional-Operational Implications of a Congressional Technology Assessment Component (1969)
- . Social Impacts of Civil Aviation (Co-author 1970)
- . The Contextual Approach to Technology Assessment: Implications for "One-Factor-Fix" Solutions to Complex Social Problems (1971)
- . Some Implications of the Technology Assessment Function for the Effective Public Decision-Making Process (1971)
- . Laws and Regulatory Schemes for Noise Abatement (Co-author 1971)
- . Social Impact Evaluation (1972)
- . Evaluative Jurisprudence (Experimental Class Materials - 1972)

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I. ADVANCING TECHNOLOGY AND SOCIAL VALUES

In the evolving context of governmental planning or efforts to initiate governmental planning of transportation systems, considerations of environmental noise have made very recent entry into the process. We have generally been concerned with the primary, direct, and immediate objectives of providing more or new transportation services than with adverse side-effects such as congestion, air pollution, noise intrusion, and aesthetic debasement.

Planning of a "complete" national transportation network was carried out in our early history. This scheme, though never enacted, was put forward in 1824 by the Corps of Topographical Engineers under the War Department. Professor A. Hunter Dupree states in Science in the Federal Government:

Despite constitutional scruples, the Congress increasingly appropriated money for roads and harbor improvements. One offshoot of Monroe's straddling position on the constitutionality of internal improvements was the Survey Act of 1824, under which the Corps of Topographical Engineers made a comprehensive plan for canals between the Chesapeake and the Ohio, along the Atlantic seaboard, and for a road from Washington to New Orleans. This plan, the only one the government ever attempted to make for the country as a whole, required considerable technical competence, and had it been executed would have required even more.¹

¹ A. Hunter Dupree, Science in the Federal Government 36 (1957).

In his first annual message to Congress of December 6, 1825, President John Quincy Adams referred to the "internal improvement of the country" in the very first sentence and then continued:

The great object of the institution of civil government is the improvement of the condition of those who are parties to the social compact, and no government, in whatever form constituted, can accomplish the lawful ends of its institution but in proportion as it improves the condition of those over whom it is established. Roads and canals, by multiplying and facilitating the communications and intercourse between distant regions and multitudes of men, are among the most important means of improvement.²

Professor Richard B. Morris in Great Presidential Decisions states in reference to President Adams' proposal that:

(T)he measures of his administration were "just and wise and every honest man should have supported them," but many did not because they simply could not abide their author, and still others because they were frightened by his centralizing philosophy of government.³

Apart from President Adams' personality difficulties there were substantial political, economic, demographic, and technological reasons why a national road system was not considered an urgent matter. As Samuel Eliot Morison states:

Watchers from afar can discern the shadow of things to come in 1826, midway in President Adams' term of office. The Erie Canal, completed the previous year, made New York the Empire State and New York City the world's most populous urban center. Yet the doom of the canal as a principal means of heavy transportation was sounded in 1826 by a little horse-drawn line, first

²Richard B. Morris, Great Presidential Decisions 109 (1960).

³Id. at 107.

railroad in the United States, built near the home of the Adamses in Quincy; and shortly the Baltimore & Ohio steam railway would be chartered.⁴

And to move further along in the last century:

Canals still carried most of the freight in 1850, but the completion of the Hudson River Railroad from New York to Albany, where it connected with the New York Central for Buffalo, and of the Pennsylvania Railroad from Philadelphia to Pittsburgh, caused such an astounding transfer of freight from canals to railroads, particularly in the winter season, as to prove the superiority of rail for long-distance hauls, and to suggest that the locomotive was the proper instrument for penetrating the continent.⁵

Surely 1800 to 1900 was the century of coal and steam. The railroad was the means of transportation in that it fitted both the conditions and needs of this rapidly expanding nation even though canals continued in operation and steamboats found their use on the Mississippi and its tributaries. A new transportation era began to emerge about 1900, however. Professor Morison's lively tract on "The Auto and the Ad Man" provides the flavor as well as some interesting facts on this transitional period.⁶

During the last century the Federal government not only tended to encourage technological development, including transportation, as by means of land grants to the railroads but, in some cases, the Federal government became directly involved. Support was lent to the "demonstration phase" of the development of the telegraph.⁷ Support was also lent to certain research efforts. For example, between 1816 and 1848 "a total of 233 steamboat

⁴Samuel Eliot Morison, The Oxford History of the American People 420 (1965).

⁵Id. at 478.

⁶Id. at 888-893.

⁷A. Hunter Dupree, Science in the Federal Government 48 (1957).

explosions had occurred in which 2,563 persons had been killed and 2,097 injured, with property losses in excess of \$3 million." While it was not until 1852 that stringent and effective laws were enacted regulating boiler construction, operation and inspection, the Franklin Institute had researched the problem in 1836 and made recommendations at that time which embodied most of the recommendations finally adopted in Federal legislation of 1852.⁸

In general, we have followed the presumption of most Western nations, namely, that the impact of scientific inquiry and technological advance is socially beneficial. From Francis Bacon on we seem to have accepted the "science is good in itself" notion. Certainly the scientific approach, however superficial, pervaded the outlook of the philosophers of the Enlightenment, that high point of belief in human rationality and the potential of man to perfect himself and society on earth. The Royal Society (chartered 1662) and similar organizations promoted the idea that "investment in science was an investment in prosperity."⁹ Such organizations as the Lunar Society (1775-1791) were more "practical minded" and socially sensitive to the impact of science and technology than the more prestigious Royal Society.¹⁰ Even the human wastage and misery inflicted by the early 19th century Industrial Revolution did not greatly diminish our infatuation with science and technology.

⁸John G. Burke, "Bursting Boilers and the Federal Power," Technology and Culture, Winter 1966, Vol. VII, at 13-23.

⁹A. Rupert Hall, "Culture, Intellectual and Social Foundations, 1600-1750," in Technology in Western Civilization, 114 (1967).

¹⁰Id. at 114-115.

However, protests were made over the abuses of expanding industrialism supported by technological development. Consider the following quote from Elting E. Morison, Men, Machines and Modern Times in reference to Thomas Huxley:

He came to Baltimore toward the end of the last century to say that he remained unimpressed by all the power, natural resources, knowledge and machinery that had so greatly extended man's competence over his physical environment. "The great issue," he went on, "about which hangs a true sublimity and the terror of overhanging fate is, what are you going to do with all these things?"¹¹

Yet the prevailing attitude continued to encourage technological development. This was particularly true in America during the 19th century where resources were abundant, the population was dispersed, transportation needs were critical and individual initiative was given the widest scope.

The industrialism supported by coal, steam and a burst of inventiveness, motivated by the excitement of "progress" and personal gain, reflected a social attitude raised to a Constitutional right through the doctrine of "freedom of contract."¹² Furthermore, numerous dedicated efforts to protect a broader and longer term concept of the "public interest" were blunted or defeated by the reluctance of the Federal government to encroach upon the traditional bounds of State "police power" over health, safety and general well-being.¹³

¹¹Morison, Men, Machines and Modern Times 208 (1966).

¹²Louis H. Mayo, "The Management of Technology Assessment," in Technology Assessment: The Proceedings of a Seminar Series, (Raphael G. Kasper, ed.). (The George Washington University: Program of Policy Studies in Science and Technology) July, 1969 at 89, specifically f.n. 22, at 99.

¹³Ibid., specifically f.n. 23. In this connection it is of interest to consider the following quotation from Richard W. Barsness, "The

We have relied primarily on the "market" system for guiding and shaping the nature of new technological applications. There have been notable exceptions, however, as with the long agitation for improved public protection from adulterated foods and drugs which eventually resulted in the first Pure Food and Drug Act of 1906. But governmental regulation has, in general, been gradual and piecemeal and - as in the case of transportation - has usually evolved as a reaction to public demand for correction of specific and severe adverse effects of particular applications. The establishment of the Interstate Commerce Act of 1887 is an example.

As is well known, many of our more prominent technology-based regulatory agencies and statutory measures to control technological applications were not established until well into the 20th century. For the most part, these agencies represent reactive measures rather than prospective efforts to assure development of a new technology in the public interest. Even broadcasting was not brought under regulatory control until 1927 after frequency interference became intolerable. The development of nuclear energy represents perhaps the most outstanding example of a new technology

Department of Transportation: Concept and Structure," Western Political Quarterly (September 1970) at 500.

Although the first congressional proposal to create a unified federal transportation agency occurred as early as 1874, and recommendations of this nature became particularly frequent from the 1930's on, Congress did not adopt cabinet-level Department of Transportation (DOT) until October 1966. The key word and theme in the official declaration of policy for the agency was coordination. President Lyndon B. Johnson cogently summarized the ultimate objective as being "a coordinated transportation system that permits travelers and goods to move conveniently and efficiently from one means of transportation to another, using the best characteristics of each."

whose development began under government supervision and for which a reasonably well-ordered assessment structure has been maintained.¹⁴

Increasingly, since World War II, technological developments have been initiated and supported by the government or through combined government and industry efforts or government-university arrangements.

The strong emphasis on promotion of the direct and immediate benefits of advancing technology through the 19th and the first half of the 20th century does not mean, of course, that all segments of the affected public were in sympathy with this underlying social philosophy and most certainly not with some of its effects. In the mid-1800's many English citizens protested vigorously over the noisy, smoky locomotives. Some landowners arranged for the intermittent firing of guns across their grounds to keep out railroad surveyors. "Parliament, exercising the right of eminent domain, eventually overcame these difficulties for the railroad companies, but only at a price: as a concession to objectors, a change was included in railway charters requiring that locomotives must not emit smoke."¹⁵ Public reaction to large steam carriages "brought forth in 1865 the famous Red Flag Act which required a flagman on foot to precede each steam vehicle."¹⁶ On the other hand, new technologies were sometimes applauded as the means by which more agreeable qualities might be introduced into the social environment.

¹⁴See Mayo, "The New Technology and National Goals: Some Implications for Legal-Policy Decision-making," 37 Notre Dame Lawyer 33, 42 (1961).

¹⁵Eugene S. Ferguson, "Steam Transportation," in Technology in Western Civilization 301 (1967).

¹⁶Ibid.

A quotation from Scientific American for July 1899 states:

The improvement in city conditions by the general adoption of the motor car can hardly be overestimated. Streets clean, dustless, and odorless, with light rubber-tired vehicles moving swiftly and noiselessly over their smooth expanse, would eliminate a greater part of the nervousness, distraction and strain of modern metropolitan life.¹⁷

¹⁷Quoted in Reason Awake: Science for Man by Rene Dubos (1970) at 95.

II. THE CONSTITUTIONAL FRAMEWORK FOR THE ALLOCATION OF GOVERNMENTAL POWER WITH RESPECT TO TRANSPORTATION SYSTEMS PLANNING

Only in recent years has environmental noise gained sufficient attention as a social problem to generate assessments of the situation, proposals for comprehensive public programs of noise abatement, and enactment of a few innovative regulatory schemes. Various factors have forced the problem to the focus of public attention, as for example, the introduction of commercial jet-powered aircraft over the past 15 years and increasing vehicular traffic resulting from urbanization and further stimulated by the Interstate Highway System. The decibel level in various noise environments is definitely increasing. But there is more involved than this simple explanation of the growing concern with noise. This can be described as a rather drastic shift in social value priorities. This general concern, of which noise intrusion is but one element, is reflected in various statutory schemes enacted over the past several years of which the most prominent is the National Environmental Policy Act of 1969 which requires pursuant to §102(2)(C), the submission of environmental impact statements on "major Federal actions" and which established the Council on Environmental Quality.¹⁸

The NEPA of 1969 and various other legislative schemes promoting environmental quality are indicative of the need for anticipatory project assessments, and hence, for more thoughtful planning of public and public/private programs in such fields as energy generation, law enforcement, health care services, and transportation. It is with respect to the initiation of various new transportation systems that public concern with the full scope of environmental values and amenities has, perhaps, been most manifest.

¹⁸ National Environmental Policy Act (NEPA), 42 U.S.C. S 4321 et seq. NEPA became effective as of January 1, 1970.

Public protests have stalled the implementation of new airports or the modification of existing airport facilities.¹⁹ Numerous lawsuits have been instigated over the past few years which have had the effect of blocking new highway construction.²⁰

There is little question but that government entities at all levels have been somewhat tardy, if not delinquent, in giving adequate emphasis to the transportation systems planning process. The "planning function" for present purposes will be discussed in terms of the provision for and implementation of anticipatory assessments designed to take into account the effects of proposed transportation innovations on all participants and social value-institutional processes affected by given proposals. Particular attention will be focused on the extent to which environmental noise is given consideration as an adverse consequence in such assessments.

The abatement of environmental noise presents a severe challenge to legal-political improvisation as well as to technological ingenuity. The problem context of environmental noise is a complex one in that noise is not associated with one - or a few - social functions but is emitted from a vast variety of completely unrelated sources. Many of the most obnoxious

¹⁹See New York Times, Oct. 22, 1972, p. 30, col. 1, "New Jetport, a Rarity Today, Ready in Missouri" which states in part:

The growing resistance to new jetports around the country by environmentalists and citizens' groups--and the ability of such groups to delay or block such projects in court--has led many aviation leaders to forecast that few new airports like the Kansas City facility will ever be built. The nation's last major new jetport opened in 1969 in Houston; no others have been started since then.

²⁰See, for example, Arlington Coalition on Transportation v. Volpe, 458 F.2d 1323 (1972) and cases cited therein.

noises come from moving sources or from multiple and diverse activities acting in concert. Hence, various techniques (abatement at the source, reduction of effects, or compensation for noise harm) have been devised in an attempt to cope with the multiplicity of sources and affected persons or activities. The noise abatement task is further complicated by the necessity to determine at what level of government these various techniques can best be prescribed and implemented.²¹

It is sometimes said that noise is a "local problem," but this characterization can be a bit misleading. No doubt, noise is a "local problem" with respect to the Effects of noise. It is not necessarily a local problem with respect to the Control over the abatement of noise at the source or over the reduction of the magnitude of noise effects. The "noise context" selected for control purposes will ordinarily be defined in terms of the noise effects emitted from particular discrete noise sources or identifiable noise environments.

²¹The range and variety of possible environmental noise abatement and control configurations are suggested by an Illustrative Regulatory Matrix prepared by the Program of Policy Studies in Science and Technology of The George Washington University. Dimensions considered include:

Baseline Data

- Noise Sources and Noise Environments
- Noise Effects
- Social Impact Evaluation of Effects - Techniques

Regulatory Configuration Elements

- Objectives and Functions
- Formal Authority and Levels of Control
- Modes of Control and Implementation Techniques
- Criteria: Units of Measurement
- Standards
- Enforcement: Remedies and Penalties
- Affected Participants

What then is the basic legal-political framework within which the environmental noise problem must be analyzed? Environmental noise is primarily the result of a highly industrialized society. In a most thoughtful book of a few years back entitled Industrialism and Industrial Man, the authors state:

Pluralistic industrialism will never reach a final equilibrium. The contest between the forces of uniformity and for diversity will give it life and movement and change.

The themes of uniformity and diversity, and manager and managed which mark the world today will characterize it in the future as well. There will be constant adjustments between these eternally conflicting themes, but no permanent settlement. They will constitute the everlasting threads of history: the uniformity that draws on technology and the diversity that draws on individuality; the authority that stems from the managers and the rebellions, however muted, that stem from the managed.²²

Our Constitutional development seems consistent with this formulation. For example, Art.I,§8(3) provides that the Congress shall have power "To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes." The 1824 Supreme Court case of Gibbons v. Ogden (9 Wheaton 1; 6 L.Ed. 23) gave impetus to the promotion of the "Commerce Clause" and interstate commerce by holding a New York law providing for a State "steamboat monopoly" invalid. The subsequent 1851 case of Cooley v. The Board of Wardens of the Port of Philadelphia (53 U.S. [12 How.] 299) has had great significance in terms of mediating between the themes of uniformity and diversity noted above. In that case the Supreme Court undertook to determine whether the

²²Kerr, Dunlop, Harbison & Myers, Industrialism and Industrial Man 296 (1960).

power of the Congress to regulate foreign and interstate commerce was exclusive or whether it might be in part shared by the states. The Court adopted a rule which placed a segment of control in the states, the test being whether a particular subject or activity of commerce requires uniform national control or whether it is sufficiently local (and unique) in character to permit State regulation. For example, a strong national interest has been asserted in railway regulation. In Southern Pacific Co. v. Arizona (325 U.S. 761 [1945]) the Supreme Court, relying on the Cooley Doctrine held that the Arizona Train Limit Law (limiting train length) contravened the Commerce Clause, the majority opinion stating that "Here examination of all the relevant factors makes it plain that the state interest is outweighed by the interest of the nation in an adequate, economical, efficient railway transportation service, which must prevail." But a strong State/local interest has been recognized in the regulation of the use of interstate as well as State highways. In South Carolina State Highway Department v. Barnwell Bros. (303 U.S. 177 [1938]), a State statute limiting the width and weight of motor trucks which was more restrictive than those of most other states was held not to be an undue burden on interstate commerce even though "interstate carriage by motor trucks has become a national industry," the Court stating: "Few subjects of state regulation are so peculiarly of local concern as is the use of state highways." But compare Bibb v. Navajo Freight Lines, Inc. (359 U.S. 520 [1959]), wherein the Supreme Court found an Illinois contour mudguard requirement for motor freight carriers to be in conflict with the Commerce Clause even though such "local safety measures" are normally not found to place an unconstitutional burden on interstate commerce.

The "states and their instrumentalities may act, in many areas of interstate commerce,...concurrently with the Federal government" and "Evenhanded local regulation to effectuate a legitimate local public interest is valid unless preempted by Federal action,...or unduly burdensome on...interstate commerce...."²³ In general, preemption by Federal legislation is not to be inferred "unless the act of Congress, fairly interpreted, is in actual conflict with the law of the state."²⁴

²³Huron Portland Cement Co. v. City of Detroit 362 U.S. 440, 441-443 (1960).

²⁴Ibid.

III. CONSIDERATION BY GOVERNMENTAL ENTITIES OF THE NOISE FACTOR IN THE ASSESSMENT OF HIGHWAY PROJECTS AND VEHICULAR OPERATIONS

Consideration of the noise factor by governmental entities in the planning of highway transportation systems has, until very recently, been notorious for its absence.²⁵ Planning in terms of anticipatory total social Impact assessments has not arrived even yet, although there are now strong tendencies in this direction.²⁶

²⁵The lateness of requirement of noise assessment of highway project planning is clearly indicated by the case of Concerned Citizens of Marlboro v. Volpe, 459 F. 2d 332 (1972), wherein the court stated after reciting S109(a) of Title 23, Federal-Aid Highway Act, 23 U.S.C. S 101-136:

Plaintiff's contention is that the reference in this provision to "safety" mandated that the Secretary not approve Route 18 construction without consideration of the extent to which noise and air pollution would increase as a result of the project. At the time S 109 was enacted, however, air and noise pollution were not considerations within its intended scope. To interpret the section as plaintiffs suggest would be unreasonable, especially when it is recognized that Congress amended S 109 in 1970 specifically to add "air, noise and water pollution" as factors to be studied before federal approval could be given to projects thereafter proposed. See P.L. 91-605 (Dec. 31, 1970), 23 U.S.C. S 109 (h). Id. at 334.

²⁶Most planning and research efforts are still somewhat narrowly focused. The RECAT study of the Ad Hoc Committee on Regulatory Effects on the Costs of Automotive Transportation of the Office of Science and Technology (April 1972) identified the priority problem as one of quieting trucks which are the noisiest vehicles on the highways. See Noise Control Report, April 17, 1972, p. 5. The July 10, 1972 Noise Control Report states that DOT awarded three contracts totaling over \$1 million for research aimed at reducing engine noise from diesel trucks. Id. at 55.

It is ironic that efforts toward more comprehensive assessment and planning of highway/vehicular configurations have not occurred until the Interstate Highway System has been over 75% completed. The Washington Daily News of February 5, 1972, p. 11, col. 4, reported:

Such planning is to be clearly distinguished from the reactive type of ad hoc regulations which have been in existence for some time relating to various types of traffic noise control.²⁷ Many municipalities have for years required mufflers on motor vehicles and some have restricted horn noise. Most states have long provided statutory requirements for mufflers and several have restrictions on horn noise. Traditionally, local ordinances have provided for subjective standards such as restricting the making of "loud," "unusual," or "unnecessary" noise rather than by establishing quantitative (decibel limit) standards. To some extent, zoning ordinances providing for "quiet zones" have reflected slightly more concern for the long-term welfare of the community.

This situation is beginning to change. Relatively new environmental noise codes in Chicago²⁸ and New York City²⁹ clearly represent a dramatic

Latest cost estimate of the 42,500-mile Interstate Highway System: \$76.3 billion up \$6.4 billion from 1970 estimate. Transportation Department says 76 percent of system is open to traffic, another 20 percent in construction or engineering phase. Environmental rows over urban and suburban links will delay completion of system until 1980.

NOTE: When system was authorized in mid-1950s, completion was targeted for this year and cost was pegged at \$45 billion.

²⁷ See EPA Report Laws and Regulatory Schemes for Noise Abatement, December 31, 1971, at Sections 1.2.2 and 1.4.2 (a Report prepared by the Program of Policy Studies in Science and Technology of The George Washington University under EPA Contract 68-04-0032 for the U.S. Environmental Protection Agency/Office of Noise Abatement and Control) hereinafter cited as EPA Report.

²⁸ See discussion of the first eight month's experience on the Chicago ordinance in Noise Control Report, August 7, 1972, p. 77.

²⁹ See discussions relating to the New York City Code in Noise Control Report, July 10, 1972, at p. 54 and also pages 124 and 139.

step forward in comprehensive planning for environmental noise control in metropolitan areas.

At the State level, California has developed a statutory scheme to assure the reduction of highway traffic noise over a period of time. The California Vehicle Code by §23130 prescribes "operational" Vehicle Noise Limits for speed limit of 35 mph or less and for speed limit of more than 35 mph. Section 23130(C) provides that "This section applies to the total noise from a vehicle or combination of vehicles and shall not be construed as limiting or precluding the enforcement of any other provisions of this code relating to motor vehicle exhaust noise." (emphasis supplied). Section 27160 of the Vehicle Code provides that "(a) No person shall sell or offer for sale a new motor vehicle which provides a maximum noise exceeding the following noise limit..." (with dates and decibel limits prescribed). Colorado and Minnesota have recently enacted legislation which is patterned closely after the California scheme.³⁰

The history of the Federal-aid to Highway programs perhaps offers the most useful insights into the environmental noise problem with respect to highway motor vehicle transportation. This program has been primarily concerned with the basic objective of moving masses of people and goods rather than with secondary or derivative environmental amenities.

³⁰See EPA Report, supra note 27, at 1-76 and 1-79.

See also Noise Control Report, May 1, 1972, p. 13 re an amendment to the Pennsylvania Motor Vehicle Code relating to noise levels.

See also The New Jersey Noise Control Act of 1971 (1/24/72) which relates to the control and abatement of noise, empowering the State Department of Environmental Protection to promulgate codes, rules and regulations for such purposes and creates a Noise Control Council. Assembly, No. 2181, introduced February 16, 1971.

The Federal-aid Highway legislation of 1916 laid the foundation for a cooperative Federal-State relationship and resulted in the strengthening of State highway departments. The Federal Highway Act of 1921 "led to the rapid development of an integrated network of improved highways throughout the entire country." Also, "In 1921 the War Department made a comprehensive study of the highway routes important to the national defense," a study which was brought up to date in 1935 through the cooperative efforts of the War Department, the Bureau of Public Roads, and the American Association of State Highway Officials. In 1941 the President appointed a National Inter-regional Highway Committee to investigate the need for a limited system of national highways and to advise the Federal Works Administrator as to the prospects for utilizing some of the manpower and industrial capacity expected to be available at the end of World War II. The Federal-aid Highway Act of 1944 directed the designation of a National System of Interstate Highways limited in extent to 40,000 miles "so located as to connect by routes as directed as practicable the principal metropolitan areas, cities and industrial centers, to serve the national defense and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico." This rationale further stressed:

The long distances of the transcontinental routes are a by-product of the selection of the most important local and regional highways which articulate into continuous routes. This concept of the system is based upon continuing traffic surveys and flow analyses which show a heavy predominance of motor vehicles making relatively short trips and a small proportion of actually transcontinental highway traffic.³¹

³¹ See on the subject of the evaluation of the Interstate Highway System: Ester J. Dudgeon, "National Interstate and Defense Highway System"

One of the more interesting episodes in the National highway system development concerns the persistent efforts of the late Congressman J. Buell Snyder of Pennsylvania. Commencing with a bill in 1936 directing the Bureau of Public Roads to survey and locate a system of transcontinental and north-south highways, Representative Snyder moved in 1937 to a proposal for a system of "superhighways" 200 feet wide with six traffic lanes, brightly lighted, with no obstructions, so that they could be used as emergency landing strips for airplanes and further suggested that airports be built at or near the intersections of such highways.³²

Perhaps most relevant to our present purpose of evaluating the Federal level highway planning process in terms of a total social impact assessment is a review of the Report of the Presidential Advisory Committee on "A Ten Year National Highway Program," attached to the Message of the President, National Highway Program, of February 22, 1955, which was referred to the Committee on Public Works, 84th Congress, 1st Session, House Document 93. In 1956 the Congress enacted major Federal highway aid legislation which was responsive to the request of President Eisenhower for:

(A) grand plan for a properly articulated (highway) system that solves the problems of speedy, safe, transcontinental travel--inter-city transportation--access highways--and farm-to-market movement--metropolitan area congestion--bottlenecks--and parking.

While the President's Message directed attention to the "Nation's highway

at 2 (1958). (Analyst in Transportation and Communications, Economics Division, Legislative Reference Service, Library of Congress.)

See also, Mayo "The National Highway Program and Motor Freight Carrier Development: A Technology Assessment Perspective," (The George Washington University: Program of Policy Studies in Science and Technology) March 22, 1969.

³² See Dudgeon supra note 31, at 5.

system, other modes of transportation being excluded,"³³ the social sub-system posited for this anticipatory assessment by both the Advisory Committee study and the House Committee on Public Works clearly disclosed an intention to include significant social interactions and implications of the proposed "National highway system." Further,

The Congressional Committee Report shows that an extremely wide range of engineering, financial, and social factors was considered. From our present perspective, however, we would note that some factors were given no attention whatever. The Advisory Committee and the Congress seemed to be much more concerned with the efficient implementation of the highway program rather than with cumulative and qualitative social impacts, particularly those which might be detrimental. No consideration was given to increasing environmental pollution which would result from the growing traffic volume: air pollution from exhausts, engine noise, resulting aesthetic debasement, or the derivative health hazards from the foregoing sources. Nor was a great deal of attention given to the relationship between the increased number and size of motor freight carriers and the possible increased hazards to private auto drivers and passengers.³⁴

Taking the Executive-Legislative anticipatory assessment of the Interstate Highway System as the planning reference base for this discussion, let's move ahead 12 years to 1968 when Senate bill S. 2658 was introduced during the 90th Congress which proposed increased maximum size and weight limits for motor freight carriers. It might have been expected that a relatively comprehensive assessment would have been made of the anticipated effects of this

³³ Presidential Advisory Committee Report, "A Ten Year National Highway Program," at 3, attached to the Message of the President, National Highway Program, of February 22, 1955. Referred to the Committee on Public Works, 84th Congress, 1st Session, House Document No. 93.

³⁴ Mayo, "The Relationship of Technology Assessment to Environmental Management," (The George Washington University: Program of Policy Studies in Science and Technology) SDP 206, October, 1969, at 21-22.

legislation. Senate Report No. 1026, Committee on Public Works, U.S. Senate of March 27, 1968, Vehicular Weights and Dimensions, to accompany S. 2658, stated that:

Among the major issues presented to the committee were those dealing with highway safety, economic impact, effects of increases on road systems and structures and the contributions of the various user beneficiaries.

Actually the Report gave very little attention to these factors other than to the impact of increased weights and widths on the existing road systems and structures. Some attention was given to highway safety and to increased maintenance and construction costs, but the Senate Report, by no stretch of the imagination, could be considered an adequate anticipatory total social impact assessment.³⁵

This conclusion was to some extent recognized and, apparently, even rationally justified as being consistent with the policy enunciated in a letter from the Secretary of Commerce of August 18, 1964, to the Speaker of the House which made the point that such a proposal as that represented in S. 2658 should be considered as only a phase of a continuing process of "progressive implementation" of the Nation's highway system. Therefore, it would seem not only fair but prudent to appraise the S. 2658 assessment in the time-dimensional context of the evolving interstate highway system. If one views the 1968 assessment in the context of the sequence of assessments made by the Congress between 1956 and 1968, a somewhat different perspective can be adopted. Numerous assessments leading to legislation or new regulations relating to air pollution, highway safety, highway beautification, citizen participation in freeway location, and reorganization

³⁵Id. at 21-22.

of the entire Federal transportation regulatory structure were conducted during the 1956-1968 interim period.³⁶ Also, pursuant to the Federal-aid Highway Act of 1956, the Secretary of Commerce had undertaken to determine

- ³⁶ a) Federal Highways, Billboard Regulations P.L. 85-381, 72 Stat. 89 (1958). Further legislation, P.L. 86-342, 73 Stat. 611 (1959); P.L. 87-61, 75 Stat. 122 (1961); P.L. 88-157, 77 Stat. 276 (1963).
- b) Air Pollution from Motor Vehicle Exhaust Fumes, P.L. 86-493, 74 Stat. 162 (1960).
- c) Clean Air Act, P.L. 88-206, 77 Stat. 392 (1963).
- d) Motor Vehicle Air Pollution Control Act, P.L. 89-272, 79 Stat. 992 (1965).
- e) Air Quality Act, P.L. 90-148, 81 Stat. 485 (1967).
- f) Interstate Compacts on Traffic Safety, P.L. 85-684 (1958).
- g) Specification of Hydraulic Brake Fluids, P.L. 87-637, 76 Stat. 437 (1962).
- h) Minimum Standards for Seat Belts, P.L. 88-201, 77 Stat. 361 (1963).
- i) Provision for State Highway Safety Programs, P.L. 89-139, 79 Stat. 578 (1965).
- j) National Traffic and Motor Vehicle Safety Act, P.L. 89-563, 80 Stat. 718 (1966).
- k) Highway Safety Act, P.L. 89-564, 80 Stat. 731 (1966).
- l) Standards for Bridge Inspection, P.L. 90-495, 82 Stat. --- (1968).
- m) Highway Beautification Act, P.L. 89-285, 79 Stat. 1028 (1965). Additional legislation, P.L. 90-495, 82 Stat. --- (1968).
- n) Establishment of the Department of Transportation, including the National Transportation Safety Board, P.L. 89-670, 80 Stat. 931 (1966).
- o) Further action relevant to the National Highway Program includes provision for broader community participation in highway planning. DOT (Bureau of Public Roads) Policy and Procedure Memorandum of January 14, 1969.

future maximum desirable dimensions and weights for vehicles operating on the Federal-aid highway systems and a report was made to the Congress on August 18, 1964.³⁷

The pertinent question remains, however, namely, whether consideration by the Congress of the various highway-related legislation during the 1956-1968 time period was "programmed" in such manner as to achieve a close approximation to a total social impact assessment through time. S. 2658 breezed through the Senate but met strong opposition in the House and was defeated, in large measure, it would appear, because many affected participants brought to the attention of the House members that several significant "social costs" had not been given appropriate consideration by the Senate.³⁸ The author has concluded in a previous paper that:

It is clear that the interim 1956-1968 legislation had the effect of filling in some of the gaps or completing lightly treated segments of the 1956 assessment. It is an interesting question, however, as to the extent to which this was accomplished by deliberate design, by simple response to insistent public or special interest demands, through serendipity from other programs such as air pollution control, or from sheer accident. Only to the extent such legislative proposals were advanced as deliberately designed components of an overall integrated program of Highway/Motor Freight Carrier technology would it satisfy the Total Impact Assessment Model. While the aggregative assessments through time did tend to expand the scope of the social sub-system treated, they do not appear to have been, in any real sense, programmed to secure a Total Impact Assessment within a socially permissible time span. The DOT/Bureau of Public Roads policy

³⁷House Document No. 354, 88th Cong., 2nd Sess., Maximum Desirable Dimensions and Weights of Vehicles Operated on the Federal-Aid Systems, of August 19, 1964.

³⁸Supra note 34, at 22.

of "progressive implementation" does not seem to be at all the equivalent of the Total Impact Assessment approach.³⁹

It may be contended, of course, that in view of the Congressional committee structure and the customary legislative approach of submitting specific bills to take care of particular problems, it is unrealistic to expect the Congress to conduct total social impact assessments of transportation systems or other public programs either at a specific time or on an aggregative basis through time. The fact remains, however, that the Congress has tended to approach transportation system development for the most part on an ad hoc, piecemeal, and non-integrative basis.

Daniel P. Moynihan has asserted that we are moving from a focus on independent programs which "relate to a single part of the system" to policy which "seeks to respond to the system in its entirety."⁴⁰ He expects this movement to be a definitive trend in the 1970's. In short, we are giving increasing attention to total social problem contexts or social systems as contrasted with programs directed toward particular parts of such systems which are not coordinated by an overall policy. "(A) policy approach to government . . . (seeks) to encompass the largest possible range of phenomena and concerns."⁴¹ Moynihan cites the 1956 Interstate and Defense Highway System as the "largest public works program in history" and states that the eventual judgment will be that it has "had more influence on the shape and

³⁹Id. at 23-24.

⁴⁰Daniel P. Moynihan, "The Concept of Public Policy in the 1970's," Speech given at Hendrix College, Conway, Arkansas, April 6, 1970, at 5.

⁴¹Id. at 11.

development of American cities, the distribution of population within metropolitan areas, and across the nation as a whole, the location of industry and various kinds of employment opportunities (and in all of these, immense influence on race relations and the welfare of black Americans) than any initiative of the middle third of the 20th Century."⁴² But he also concludes that "the politics of getting the Interstate Highway Program enacted, decreed, or at least indicated, the narrowest possible definition of its purposes and impact."⁴³

Moynihan comments with reference to the planning and implementation of the Interstate Highway System by the Bureau of Public Roads:

As bureaucrats, their instinct was faultless. Had anyone realized what they were in fact doing, the sheer magnitude of the interests they were affecting, it is nigh impossible to imagine that they would have won acceptance. Indeed, a bare fifteen years after the Interstate program commenced, it is near impossible to get a major highway program approved in most large American cities. But it is too late: most systems have been built. In the process--such at least would be my views--quite appalling mistakes were made, but they were mistakes having to do with issues nominally altogether unrelated to the highway program itself, and so no one was responsible for them⁴⁴

Surely it is possible to hope for something more. Government must seek out its hidden policies, raising them to a level of consciousness and acceptance--or rejection--and acknowledgement of the extraordinary range of contradictions that are typically encountered. . . Surely also it is possible to hope for a career civil

⁴²Id. at 15. See also, Juan Cameron, "How the Interstate Changed the Face of the Nation," Fortune, July 1971, p. 78.

⁴³Moynihan, supra note 40, at 17.

⁴⁴Ibid.

service that is not only encouraged, but required to see their activities in the largest possible scope.⁴⁵

Whatever the anticipatory assessment deficiencies of the Congress,⁴⁶ it has, in recent years, enacted a number of regulatory schemes which obligate the Department of Transportation to take into account a broader range of social impacts than has been customary in the past. For example, §138 of the Federal-aid to Highways Act of 1968, 49 U.S.C.A. §1653(f) (Supp. 1971) provides in part that "It is hereby declared to be the national policy that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites" and implements this policy with specified requirements placed on the Secretary of Transportation. And the National Environmental Policy Act of 1969 - §102(2)(C) requires environmental impact statements be submitted on all "major Federal actions."⁴⁷ Numerous court cases are now being initiated which attempt to secure strict compliance by the Secretary

⁴⁵Id. at 18.

⁴⁶Hopefully, the enactment of the Technology Assessment Act of 1972, Public Law 92-484, 92nd Cong., H.R. 10243, of October 13, 1972, reflects a more favorable attitude of the Congress toward the needs for adequate anticipatory project assessments.

⁴⁷Several states now have or are contemplating comprehensive environmental quality legislation patterned to some extent along NEPA lines. The California scheme, for example, requires environmental impact statements similar to NEPA's. In this connection see Friends of Mammoth v. Board of Supervisors of Mono County, September 2, 1972, Sac. 7924, Supreme Court of the State of California, which held that the California Environmental Quality Act of 1970 (Pub. Resources Code, SS 21000-21151) requires that a municipal body submit an environmental impact report pursuant to S 21151 before it issues a conditional use or building permit to a private developer.

with the provisions of these acts.⁴⁸ While there is some evidence that many citizens are becoming resentful over the delays in public project completion resulting from court actions and with the inevitable additional costs incurred by such delays, the Courts continue with vigorous application of NEPA.⁴⁹

⁴⁸See, for example, Named Individual Members of the San Antonio Conservation Society v. The Texas Highway Department, et al., and the United States Department of Transportation, 446 F 2d 1013 (1971).

See also Nolop v. Volpe, 333 F. Supp. 1364 (1971) wherein the court stated in part:

To have standing the plaintiffs need only show that the challenged action has caused them injury in fact, economic or otherwise, and that the interest asserted is within the interest sought to be regulated by statute. Pennsylvania Environmental Council, Inc. v. Bartlett, 315 F. Supp. 238 (M.D.Pa. 1970). The plaintiffs have met these tests. If the road project is executed the plaintiffs will be subjected to increased noise pollution and dangerous traffic-pedestrian conflicts. The plaintiffs asserted their interest under a Congressional mandate requiring federal agencies to file an environmental impact statement. Id. at 1367.

See also Noise Control Report, July 24, 1972, p. 64 re the preliminary injunction stopping construction on the 17-mile Century Freeway, linking Los Angeles and Norwalk, until additional hearings could be held on noise and air pollution.

⁴⁹See Science, 28 January, 1972, p. 394-395, "Environmental Action Organizations Are Suffering from Money Shortages, Slump in Public Commitment." However, strong support for the strict application of NEPA is continuing in the courts. See, e.g., Interstate Commerce Commission v. Students Challenging Regulatory Agency Procedures (SCRAP), 93 S.Ct. 1 (1972). Some courts, in construing the requirements of NEPA, have emphasized not only the legal obligation but the utility of public hearings in the evaluation of environmental impacts. For example, in Arlington Coalition on Transportation v. Volpe, 458 F. 2d 1323 (1972) the Court States that:

Study by experts is not the equivalent of a public hearing, and continuing evaluation of the economic

Furthermore, certain legislation of recent years makes specific reference to the abatement of highway noise. Starting in 1956, the Secretary of Commerce (duties transferred to the Secretary of Transportation since 1966) was required to "cooperate with the States . . . in the development of long-range highway plans . . . which are formulated with due consideration to their probable effect on the future development of urban areas of more than fifty thousand population." The first active consideration of highway noise at the Federal level was Policy and Procedures Memorandum 20-8 of the Bureau of Public Roads, issued January 14, 1969. Environmental effects, which must be considered by the State or local sponsor seeking

effects of Arlington I-66 based only on such study is, therefore, not consideration within the meaning of the statute. Id. at 1338.

In Environmental Law Fund v. Volpe, 340 F. Supp. 1328 (1972), the opinion states that even if a "major Federal action" such as a highway project is "initiated" prior to January 1, 1970, when NEPA became law, that if the planning phase of the project did not take place until after January 1, 1970, the S 102(2)(C) statement is still required. However, if the planning and "design approval" preceded the passage of NEPA, an environmental impact statement is required only if "practicable." The court identified four major factors to determine practicability after the project has passed the planning stage:

1. The participation of the local community in the planning of the project. "In regard to highway projects, PPM 20-8 clearly acknowledges the importance of public hearings and local participation in the decision-making process." Id. at 1334.
2. The extent to which the state department involved has attempted to take environmental factors into account in regard to a particular project.
3. The likely harm to the environment if the project is constructed as planned.
4. The cost to the state of halting construction while it compiles an environmental impact statement.

Federal aid, are defined to include "noise, air, and water pollution."

Pursuant to a 1970 amendment to the Federal-aid Highway Act (PL. 91-605) the Secretary of Transportation is directed "to assure that possible adverse economic, social, and environmental effects have been considered in developing . . . (any Federally aided highway) project . . ." Further, he is to "develop and promulgate standards for highway noise levels compatible with different land uses after July 1, 1972."⁵⁰

⁵⁰See discussion of these points in EPA Report, supra note 27, at §1.1.2(A). The regulations proposed by the Federal Highway Administration pursuant to section 136 (h) of the Federal-aid Highway Act appear in 37 Fed. Reg. 8398 (April 26, 1972). The proposed regulations pursuant to section 136(i) appear in 37 Fed. Reg. 11730 (June 13, 1972). The approach taken in the two proposals is quite different. The 136 (h) regulations, to be issued pursuant to the requirement that "the Secretary . . . promulgate guidelines designed to assure that possible adverse economic, social, and environmental effects relating to any proposed project on any Federal-aid system have been fully considered in developing such project," require that State officials produce a NEPA-like study as part of their submissions for location or design approval. As stated in the proposal,

The purpose of these guidelines is to build into State highway procedures specific processes whereby social, economic and environmental effects will be considered, and to require, as part of the requirements of obtaining either design or location approval from the Federal Highway Administration, that adverse effects have been recognized and considered in making the determination to go forward with the project . . . This memorandum further requires States . . . to prepare a discussion of adverse social, economic, environmental and engineering effects. The discussions must include a recognition of such adverse effects, an analysis of reasonable and prudent measures to eliminate or minimize such effects and the estimated cost of alternate measures considered.

The proposed regulations pursuant to section 136(i) specify noise level standards for new highways based on the land use in the vicinity of the proposed highway. "The purpose of the proposed PPM is to provide noise standards for use by State highway agencies and FHWA field offices in the planning and design of Federal-aid highways, and to assure, to the extent feasible, and in the best overall public interest, that adequate measures are taken to prevent highway noise from exceeding levels compatible with different land uses."

Perhaps the most significant noise abatement action ever taken is the Noise Control Act of 1972⁵¹ which provides for the establishment of Federal noise standards for a variety of products including "transportation equipment."⁵² This will involve the setting of noise emission standards on "new products" operated in or transported in interstate commerce. The Act also provides specifically for the establishment of "noise emission standards setting such limits on noise emissions resulting from operation of motor carriers engaged in interstate commerce."⁵³ (emphasis supplied) It is also of importance that Federal noise emission standards will be set for "construction equipment"⁵⁴ since some of the more objectionable noise situations arise from the implementation stage of highway development as well as the operational-traffic stage. At the minimum, it can be concluded that a reasonably comprehensive statutory framework has now been created for noise control over the entire highway/vehicular configuration. This statutory scheme covers all of the principal stages of highway development: assessment, planning, implementation, and operation. It is to be noted that the Federal noise standards will apply only to "new products" and hence to the manufacturing stage (with the exception of railroad and interstate motor carrier operations) and that control over environmental noise from various sources is otherwise left to the states or the political subdivisions thereof "through the licensing, regulation, or restriction of the use,

⁵¹ See Congressional Record - Senate of October 18, 1972, p. S 18638 re the Noise Control Act of 1972. Public Law 92-574 of October 28, 1972.

⁵² Id. at Sec. 6 (a) (1).

⁵³ Id. at Sec. 18.

⁵⁴ Id. at Sec. 6 (a) (1).

operation, or movement of any product or combination of products."⁵⁵

It is evident that a coordinated approach is required to cope with highway/vehicular noise problems including 1) reduction of noise at the source (vehicular noise); 2) controlling the use of land in the vicinity of highways; and 3) controlling the potential noise level through assessment, planning and design of highway projects.⁵⁶

⁵⁵Id. at Sec. 6 (e) (1).

⁵⁶See Noise Control Report, October 16, 1972, p. 125. Talk by R. R. Bartelsmeyer, acting Federal Highway Administrator.

IV. GOVERNMENTAL ASSESSMENT OF THE AIRCRAFT NOISE PROBLEM

Despite certain disclaimers by the Congress that Federal governmental action has not completely preempted State and local regulation of aircraft noise, it is generally acknowledged that the unique characteristics of air traffic require Federal action for effective control. Hence, this discussion will focus on Federal control of aircraft noise with comments, as appropriate, on State and local noise abatement regulatory efforts. While there have been several successful private suits brought on the theory of a "partial taking" (or inverse condemnation), commencing with United States v. Causby in 1946,⁵⁷ it is evident as noted by the court in the 1969 New Jersey case of Township of Hanover v. The Town of Morristown (wherein plaintiffs sought to enjoin the Town of Morristown from enlarging its airport for reason of anticipated increased noise from an expanded airport operation) that "private compensatory damage suits do not accomplish the end objective of noise suppression."⁵⁸

The 1970 Department of Commerce Report on The Noise Around Us asserts that pursuant to the Federal Aviation Act of 1958 requiring each particular model or make of aircraft to obtain an "airworthiness certificate" and an "air operating certificate" that:

It is clear that the FAA has, . . . full power to prescribe air traffic rules for the "protection of persons and property on the ground," including prescription of air traffic rules in the interest of noise abatement.⁵⁹

⁵⁷328 U.S. 256 (1946).

⁵⁸261 A.2d 692, 707 (1969).

⁵⁹The Noise Around Us 146 (1970).

While there may have been some doubts about this authority as of 1958, Michael Wollan, in his article on "Controlling the Potential Hazards of Government-Sponsored Technology" indicates that even though noise per se was not mentioned in the Federal Aviation Act of 1958, it was generally assumed as of 1961 if not earlier, that the FAA had the authority to prescribe aircraft noise standards. Wollan comments:

A year later (1961) when Congress made its first appropriation for research on SST feasibility, the FAA discussed more specifically the standards it would use to regulate the SST's engine noise. FAA's new administrator, Najeeb Halaby, told Congress: "We would try to see to it that the noise levels were tolerable to the community or as tolerable as the then existing aircraft."⁶⁰

It was with the passage of the Department of Transportation Act of 1966 that statutory authority was first specifically granted relevant to aircraft noise, but no explicit provision was made for regulation. Section 4(a) of the Act directs the Secretary of DOT to "promote and undertake research and development relating to transportation, including noise abatement, with particular attention to aircraft noise."

All major participants in the national air traffic system have recognized the existing and evolving dimensions of the aircraft noise problem since shortly after World War II, although the more serious implications might not have become clear until the introduction of jet-powered fleets in the late 1950's. Report No. 1463 of May 23, 1968, of the House Committee on Interstate and Foreign Commerce states:

⁶⁰ 36 Geo. Wash. L. Rev. 1105, 1120 (1968). But see Conclusion 12 of Report of the Jet Aircraft Noise Panel of the Office of Science and Technology, Executive Office of the President, on Alleviation of Jet Aircraft Noise Near Airports of March, 1966, at 6.

The right to use the airspace over the United States in the operation of aircraft has long been established. Aviation has become an essential and widely approved part of our national transportation system. However, aircraft noise and sonic boom are unwanted and unpleasant. At this stage of engine and aircraft development there are no easy nor ready solutions to the continuing and increasing problems.

A subcommittee of this committee first held hearings on aircraft noise in September 1959 at the New York International Airport. The House of Representatives adopted House Resolution 420 in August of 1961 which specifically authorized the Committee on Interstate and Foreign Commerce to investigate the problem, and in February of 1963 the committee published the "Investigation and Study of Aircraft Noise Problems" (88th Cong., 1st Sess., H. Rept. No. 36).

Over the last ten years we have had numerous panels of experts, with representatives from virtually all segments of the aviation industry, as well as from local governments and the Federal Government. Airport operators, manufacturers, air carriers and their associations, local port authorities, municipal groups, NASA, the Federal Aviation Administration, the Department of Housing and Urban Development, and the Department of Transportation have all made contributions looking toward solutions, particularly of the noise problem, but also many of them have been giving increasing attention to the sonic boom problem.

The noise problem is basically a conflict between two groups or interests. On the one hand, there is a group who provides various air transportation services. On the other hand there is a group who live, work, and go to schools and churches in communities near airports. The latter group is frequently burdened to the point where they can neither enjoy nor reasonably use their land because of noise resulting from aircraft operations. Many of them derive no direct benefit from the aircraft operations which create the unwanted noise. Therefore, it is easy to understand why they complain, and complain most vehemently. The possible solutions to this demanding and vexing problem which appear

to offer the most promise are (1) new or modified engine and airframe designs, (2) special flight operating techniques and procedures, and (3) planning for land use in areas adjacent to airports so that such land use will be most compatible with aircraft operations.⁶¹

Congressional hearings in 1962 "confirmed a 1960 House Committee recommendation that 'noise criteria' be mandatory requirements in drafting specifications for future . . . aircraft," since the lack of "maximum noise" criteria established by the Federal government appeared to have been a "deterrent to manufacturers to achieve greater noise suppression." It is obvious that competitive considerations restrained the aircraft engine manufacturers from allocating substantial research resources to aircraft noise abatement. Rather the objective was to "build engines and aircraft (with) maximum performance characteristics without regard to noise."⁶² However, there were R&D efforts at the Federal level during the 1960's to cope with the aircraft noise abatement problem, as for example, the NASA "Quiet Engine" project.⁶³ Nevertheless, despite the preemption by the Federal government over aircraft flight operations pursuant to the Federal Aviation Act of 1958 and what might plausibly appear to be a corresponding responsibility for the full consequences of such operations, including noise suppression, the Federal government, overall, moved slowly. This would seem to have

⁶¹Report of the House Committee on Interstate and Foreign Commerce of May 23, 1968, Report No. 1463, at 3-4.

⁶²See EPA Report, supra note 27, at 2-78 through 2-80.

⁶³See Report No. 1463 on Aircraft Noise Abatement to accompany H.R. 3400, committed to the Committee of the Whole House on the State of the Union, May 23, 1968, at 18-19. See NASA Release of August 27, 1971, No. 71-156 re "First Quiet Engine Noise Tests."

been an inevitable consequence of the 1962 Supreme Court case of Griggs v. Allegheny County⁶⁴ which held the airport operator liable for damages, including noise caused to a homeowner by aircraft operations and, therefore, completely absolved the airline operators and the Federal government from any responsibility whatsoever.

The authority of the Griggs decision had the effect of obstructing the coordinated efforts required of all involved participants called for by the OST Jet Aircraft Noise Panel in 1966 to abate aircraft noise.⁶⁵ Further, Congress gave some thought to the possibility of the Federal government's indemnifying all airport operators throughout the U.S. against judgments obtained against them for noise damage alleged under the Griggs doctrine but found this to be "impracticable."⁶⁶ Hence, it was not until

⁶⁴ 369 U.S. 84 (1962).

⁶⁵ See Report of the Jet Aircraft Noise Panel of the Office of Science and Technology, Executive Office of the President, on Alleviation of Jet Aircraft Noise Near Airports of March 1966, Conclusion 17, at 7.

⁶⁶ See EPA Report, supra note 27, at 2-81 and 2-82. With respect to governmental compensation for noise abused citizens it is of interest to note the following AP news item from the Washington Post of Nov. 12, 1972, p. F 3, col. 7:

LONDON (AP)--The British government plans to ease the plight of citizens whose lives are affected by advancing transport technology. Legislation outlined this week will provide compensation for people who suffer when new highways and airports are built near their homes. The only persons compensated when a new highway or airport is built now are those whose homes are actually demolished to make way for the development. The legislation, to be put before Parliament soon, recognizes that those who have to live next to the noise and dirt that transport hauls in its wake are entitled to protection. Insulation against noise will be provided free for living rooms and bedrooms when traffic noise rises above stipulated levels. Money will be paid those forced to

the passage of §611 in 1968⁶⁷ relating to the abatement of aircraft noise and sonic boom and the subsequent promulgation by the FAA of noise standard regulations on December 1, 1969, pursuant thereto, that the aircraft engine manufacturers and the airlines had a compelling incentive to introduce noise reduction criteria into their planning and operations.

FAA Type Certification of commercial aircraft delivered after December 1, 1969, under Part 36 of the FAA Aircraft Regulations, is perhaps the most significant Federal action to date for control of aircraft noise. The DC-10 and Cessna Citation 500 have been certificated, and the L-1011 and all subsequent subsonic aircraft will have to comply with Part 36; the Boeing 747 was allowed until December 1, 1971, for compliance. These planes are significantly quieter than older planes, but effectiveness of Type Certification at a given point in time will depend on the make-up of the fleet at that time. Projections by the Air Transport Association estimate that by 1975 only 18.6% of the fleet will have been certified under Part 36. Thus, to the extent that it depends upon type certification as presently structured, the noise problem will have been only

leave their homes, over and above the compulsory purchase price now paid. Houseowners will be given up to 1,500 pounds--about \$3,675--if they are deprived of homes where they have lived for seven years or more. They will have a statutory right to be rehoused at an equivalent standard. Local authorities will be urged to sell municipal houses to the dispossessed on beneficial terms. The compensation plan is expected to cost about \$150 million a year.

⁶⁷ An amendment to the Federal Aviation Act of 1958. See EPA Report supra note 27, at 2-47 through 2-54 and 2-83, 2-84.

slightly relieved by 1975 and could remain significant until 1990.⁶⁸ A recent study has seemed to reach approximately the same conclusion through use of an NEF contour area measurement.⁶⁹

Regulations with respect to retrofit, sonic boom, SST type certification, and STOL/VO TL type certification are still in the developmental stages.⁷⁰ Of all potential regulations, retrofitting would most likely bring about the most effective noise reduction in the short-term, while type certification regulations will probably be most effective in the long run. Of course, effectiveness will depend upon the maximum permissible noise levels set. The abatement effects of modest noise reduction requirements with respect to type certification could be more than offset by an increase in air traffic in certain situations.⁷¹

⁶⁸See EPA Report supra note 27, at §3.1.1 and U.S. Environmental Protection Agency, Report to the President and Congress on Noise (December 31, 1971) at 4-36.

⁶⁹See Aircraft Noise Analysis for the Existing Air Carrier System (September 1, 1972), a Bolt, Beranek and Newman Report (No. 2218) submitted to Aviation Advisory Commission. The Report states under Conclusion A-3:

Allowing the air carrier fleet to grow by normal retirement of older aircraft, with replacement and growth supplied by currently certified aircraft, when coupled with the use of the noise abatement flight procedures specified above, will reduce the average areas enclosed by NEF 30 and NEF 40 to approximately 80% of 1972 values by 1976, remaining essentially constant to 1980 (the noise reduction due to newer aircraft being offset by increased size of fleet), and dropping to approximately 60% by 1985. (See Figure II-1.) Beyond 1985, with no other change, noise exposure will increase as more aircraft go into service.

⁷⁰See EPA Report to the President and Congress on Noise (December 31, 1971) at 4-6.

⁷¹Both NASA and the Department of Transportation now seem to be moving energetically on the development of quieter aircraft engines. See

As a result of the pervasive Federal regulation of air transportation pursuant to the Federal Aviation Act of 1958, State and local jurisdictions have been effectively precluded from control over aircraft noise.⁷² Local ordinances undertaking to control noise, as, for example, by prohibiting flights over the city at less than 1,000 feet, have been struck down for

note on NASA's effort to have a quiet engine for STOL aircraft developed. Science News, Vol 102, July 8, 1972, p. 26, and NASA Release 72-166 with respect to jetliners. See also Noise Control Report of July 10, 1972, page 59 which noted that the FAA had awarded four contracts in the amount of \$4 million to two corporations and one university to study jet engine noise reduction. And in the September 4, 1972, Noise Control Report at page 93 it was announced that NASA had awarded \$5.6 million in contracts for initial designs for the modification of the jet engines which are currently in use to power the older, noisier jets. FAA on July 25, 1972 published at 37 Fed. Reg. 14814 a notice of proposed rule-making. The proposed rule would apply the Part 36 noise standards for new types of aircraft to newly produced individual aircraft of older types not presently subject to Part 36. The legal instrument FAA would use to insure compliance with noise standards by the new aircraft would be the airworthiness certificate. The rule is proposed to govern all aircraft which receive their certificates after July 1, 1973, for larger aircraft and after July 1, 1974, for smaller aircraft. FAA is now receiving and considering comments on the proposed rule and whether or not it will be adopted is still in doubt.

See, however, Washington Star-News of November 23, 1972, p. 3, col. 2, which states that "Virtually all funds that Congress appropriated for three key research programs aimed at developing technology for quieter jet airplanes have been impounded by the Nixon administration." This action by OMB, in effect, reduced the NASA budget by \$44.9 million and, according to the report, placed "a cloud over the entire noise abatement program."

⁷²A recent case on preemption is that of Lockheed Air Terminal v. City of Burbank, 457 F.2d 667 (1972) (CCA 9th Cir.) wherein the owner and operator of the airport brought suit against the city and certain of its officers seeking, inter alia, a judgment declaring the invalidity of a city ordinance prohibiting jet aircraft from taking off between the hours of 11:00 P.M. and 7:00 A.M. The Federal circuit court affirmed the U.S. District Court for the Central District of California which held for the plaintiff airport owner and operator, stating that the pervasiveness of federal regulation in the field of air commerce, the intensity of the national interest in that regulation, and the nature of air commerce itself, compelled the conclusion that state and local regulation in that area has been preempted.

being in conflict with FAA regulations or for imposing an unreasonable burden on interstate commerce, or both.⁷³ On the other hand, it is quite clear that the Federal government has not accepted a level of responsibility for aircraft noise abatement (in terms of timely R&D and regulatory measures to reduce noise at the source) which corresponds to the magnitude of control it exercises over air transportation. Yet, the Griggs doctrine places liability for aircraft noise on the airport owner-operator which is, in most situations, a State or local governmental entity. Furthermore, the threat of massive damage awards is definitely increasing since the aircraft noise situation is worsening in many areas.⁷⁴ While it may be generally agreed that air transportation must be regulated at the national level, the lack of a corresponding national effort to abate one

⁷³See EPA Report, supra note 27, at §2.3.1 and §2.4.1(C).

⁷⁴See EPA Report, supra note 27, at §2.4.1 (F). See New York Times of July 23, 1972, p. 24, col. 3 re "California Jetports Facing Dual Problems With Noise." The story notes that in the last decade the City has had docketed against it in connection with aircraft noise from the Los Angeles International Airport more than \$4 billion in law suits. Further, as a result of the California Supreme Court holding in Nestle v. Santa Monica, L.A. 29940, Super. Ct. No. C-915322, April 28, 1972, (4 ERC 1080) the City became subject to greatly extended liability for "nuisance" caused by the noise created by jet aircraft using the Santa Monica airport. While the California Supreme Court held that testimony of Santa Monica's expert witnesses that noise created by jet aircraft using the airport would not cause hearing loss and that property values had not been adversely affected would support the trial court's holding that there was no action against the city on the theory of inverse condemnation, the Court further held that neither the general rule of governmental immunity under the California Government Code nor the Tort Claims Act's exception of nuisance barred an action by residents claiming that vibration, fumes and noise emanating from the Santa Monica airport created an actionable nuisance pursuant to Section 3479 of the California Civil Code. Noise Control Report of August 7, 1972, p. 76 states:

of its most distressing side-effects encourages resort to the courts as the only means of prodding, indirectly, a sluggish Federal system into action.⁷⁵

Since the states and municipalities as airport owners-operators must bear the direct and immediate burden of complaints from the noise-abused public, they have seized upon whatever interstitial measures are available (governmental, technical, economic, etc.) to lessen the impact of community complaints and noise damage judgments. Notable in this connection is the doctrine of proprietary control over airport operations which has its source in the concept of private ownership and operational status as distinguished from operation of the airport by a State or local governmental entity in its governmental capacity.⁷⁶ While the Port of New York Authority has been able to maintain noise standards set by itself (less stringent, however, than FAA standards for new aircraft) and

Out-of-court settlements totaling nearly \$1.8 million have been accepted by 34 families involved in Superior Court civil suit complaining that noise of jets taking off from Los Angeles International Airport's north runway was "indecent and offensive to the senses." Remaining 64 families are requesting \$20,000 damages for each home, \$5,000 damages for each homeowner and \$100,000 for each apartment building. Defendants in the civil complaint are the city, 21 airlines who use airport, and jet plane manufacturers. Class action suit charges "noise, vibration and fumes" of jets using north runway have damaged homes and caused personal pain and emotional disturbances to residents. City is charged with failure to properly plan for the runway by not purchasing property adjacent to the airport. Property values reportedly have declined due to noise and damage to homes. Remedies proposed include closing runway during evening hours, and restricting takeoffs.

⁷⁵See EPA Report, supra note 27, at 2-104 and 2-105.

⁷⁶Id. at §2.4.1(E).

the new California regulations on noise standards for airports are essentially grounded on the "power of airport proprietors," this regulatory technique has severe limitations. This is particularly true for short-term relief since most major airports are now situated in densely populated areas and proprietary control over noise reduction at the source is essentially non-existent. The FAA has clearly preempted aircraft operations as to safety. As to noise, the airport operator is left with whatever marginal control he can exercise through such a measure as "planning runway utilization schedules to take into account adjacent residential areas, noise characteristics of aircraft and noise sensitive time periods" which is provided, among other methods, in the California noise regulations for airports.⁷⁷ While the proprietary doctrine may provide the airport operator some small but useful bargaining leverage vis-a-vis the Federal government in the present evolutionary phase of aircraft noise regulation, it is based on an uneasy legal assumption, namely, that an instrumentality of the state, acting in a private, non-governmental capacity, has a degree of control over the activities prescribed in its State-originated charter which the state itself is precluded from exercising.

Federal legislation since the enactment of §611 in 1968 provides some support for aircraft noise abatement. Noise is an environmental impact and should be considered in §102(2)(C) environmental impact statements for airport development and modification. There are no Federal noise standards for airports. The Airport and Airways Development Act of 1970 declares it to be "national policy that airport development projects authorized pursuant to this part shall provide for the protection and enhancement of the natural

⁷⁷Id. at 2-102 and 2-103.

resources and the quality of the environment of the nation."⁷⁸ This Act also provides for public hearings on airport projects, if requested.

An evaluation of the Federal role in aircraft noise abatement planning must be approached with some caution and many qualifications. Approximate total social impact assessments have been initiated at the Federal level as studies; for example, Report of the Jet Aircraft Noise Panel of the Office of Science and Technology, Executive Office of the President, on Alleviation of Jet Aircraft Noise Near Airports of March 1966, and the Joint DOT/NASA Civil Aviation Research and Development Policy Study of March 1971. However, these studies were not intended for and have not led to the development of a national plan for aircraft noise abatement. Perhaps more illustrative of the comprehensive planning approach are the Metropolitan Aircraft Noise Abatement Policy Studies (MANAPS) of HUD/DOT initiated in 1969 which are now being developed into a Planning Guidelines Manual for use by metropolitan communities in the modification of existing airports or the location of new airports.⁷⁹

⁷⁸49 U.S.C. S 1716 (c)(1) (Supp. 1971).

⁷⁹See Aircraft Noise Impact (Planning Guidelines for Local Agencies) prepared by Wilsey & Ham (WH 979-1) of July 1972. This Report considers:

- The Planning Context
- Defining the Noise Problem
- Options for Reducing Noise Conflicts
- Developing a Noise Abatement Program
- The Future of Noise Abatement Policy

One of the more thorough studies of airport location including consideration of the noise factor was that of the proposed new London Airport. See paper presented at the NATO Advanced Institute on Technology Assessment, Milan, Italy, September 18-29, 1972, entitled The Third London Airport: a Case Study by Frank P. Thompson, Civil Aviation Authority, London. See also in this connection Samuel Eilon, "Goals and Constraints in Decision-Making," 23 Operational Research Quarterly 3 (March 1972).

The central thrust of this effort is to provide alternative strategies for achieving land use development compatible with airports.

There are, of course, plausible reasons which can be advanced to rebut the implied suggestion above that the Federal government, in view of its pre-emption of control over aircraft operations, might reasonably be expected to assume a commensurate responsibility for aircraft noise abatement. For example, the problem might be handled in several ways, including: abatement at the source (reducing engine noise); reduction of the effects of noise as by buffers, insulation, or compatible land use management; and provision for compensation for those harmed by aircraft noise. The Federal government has restricted its efforts primarily to noise reduction at the source as reflected in the enactment of §611. It has rejected the assumption of liability for aircraft noise as it was privileged to do pursuant to the Griggs case. It has not intervened in the land use management function, this being a traditional prerogative of State and local jurisdictions under the "police power."⁸⁰

The upshot of the situation described is that municipalities, whose citizens are directly and adversely affected by the noise, must suffer the social costs without benefit of regulatory authority. This being the existing condition, states and cities have grasped whatever legal and non-legal devices are available to protect themselves from liability as well as to reduce the complaints of noise-abused citizens. This is why the proprietary doctrine has been asserted and to some extent applied by the

⁸⁰ See EPA Report, supra note 27, at § 2.4.1 (A).

Port of New York Authority. And the Preamble of the Noise Regulations for California Airports states, somewhat unconvincingly it might be added, that:

These standards are based upon two separate legal grounds: (1) the power of airport proprietors to impose noise ceilings and other limitations on the use of the airport, and (2) the power of the state to act to an extent not prohibited by federal law.

The fact of the matter is that such control seems marginal at best. However, in the wake of Nestle v. Santa Monica, California airports appear intent on trying.⁸¹ Further, noise abatement programs involving comprehensive land use schemes are either so costly or so long-term or so politically-charged that such alternatives offer little short-term surcease.⁸² States

⁸¹See note 74 supra describing the "nuisance" liability potential for noise intrusion. See also New York Times, July 23, 1972, p. 24, col. 3, which recites that Los Angeles International Airport will be imposing as of December 1, 1972, "the most stringent operating restrictions on jetliner flights in the nation for noise abatement."

The possibilities under consideration. . . include requiring certain flights to make their landing approaches to the airport over the Pacific surf-line west of the airport rather than over residential communities; requiring some flights to make steeper descents during their approaches to the airport; reducing the number of people exposed to the noise, and reducing operations between 10 P.M. and 7 A.M.

The FAA has established a new standard of "Get-'Em-Higher Earlier" departure procedure designed to reduce jet aircraft noise over airport communities. See Release 72-158 of August 8, 1972.

⁸²But see New York Times, July 23, 1972, p. 24, col. 3 which states that:

The city of Los Angeles is spending more than \$200 million to buy and raze more than 2,000 homes, schools and shops near the airport and has experimentally soundproofed many homes and schools to make the whine and roar of jets less annoying.

That there are serious conflicts among the major participants in the aircraft noise decisional context was again manifested in the rejec-

or localities would seem to have some appreciable degree of control over aircraft noise effects only with respect to new airport developments.⁸³ The Minnesota Airport Zoning Act⁸⁴ is a notable illustration of this type of State/local initiative, providing for appropriate regional governmental entities, eminent domain powers, land use and development controls, and intergovernmental tax sharing arrangements which may assure minimum noise intrusion if a major new airport is constructed in the Minneapolis-St. Paul metropolitan area.

It seems a reasonable conclusion that both piecemeal and tardy action by the Federal government with respect to aircraft noise avoidance and abatement assures the continuance of this troublesome environmental intrusion for some years to come. However, provisions of the new Federal Noise Control Act of 1972 may encourage a strong EPA input into FAA aircraft noise regulatory procedures which may, in time, produce accelerated amelioration of this problem. Section 7 (a) provides:

tion by the Airport Operators Council International of proposed FAA standards for measuring airport noise. According to the Washington Evening Star of October 12, 1971, p. A-7, col. 1, "Airport managers around the nation complained sharply about the original proposal, arguing that it might force them to purchase tens of thousands of homes near airports at a cost of several billion dollars." The dispute centered in part over the use of the "noise exposure forecast" measure of noise effects; the airport operators feel that the use of this measure might be invoked in legal proceedings to their damage.

⁸³The new Kansas City Jetport was located 17 miles from the center of the city so as to facilitate mobility and to avoid noise intrusions on large numbers of residents. See New York Times, Oct. 22, 1972, p. 30, col. 1. It is also proposed that the jetport proprietor will control large land areas adjacent to the airport so as to monitor development and avoid future protests of citizens should new residential sections be permitted within 10 miles of the airport.

⁸⁴See Chapter 1111, 1969 Session Laws, Minnesota.

Aircraft Noise Standards

Section 7. (a) The Administrator (of EPA) after consultation with appropriate Federal, State, and local agencies and interested persons, shall conduct a study of the (1) adequacy of Federal Aviation Administration flight and operational noise controls; (2) adequacy of noise emission standards on new and existing aircraft, together with recommendations on the retrofitting and phase-out of existing aircraft; (3) implications of identifying and achieving levels of cumulative noise exposure around airports; and (4) additional measures available to airport operators and local governments to control aircraft noise. He shall report on such study to the Committee on Interstate and Foreign Commerce of the House of Representatives and the Committees on Commerce and Public Works of the Senate within nine months after the date of the enactment of this Act.

And Section 7 (b) which amends S 611 of the Federal Aviation Act of 1958 recites such amended section in part:

"(c)(1) Not earlier than the date of submission of the report required by section 7 (a) of the Noise Control Act of 1972, EPA shall submit to the FAA proposed regulations to provide such control and abatement of aircraft noise and sonic boom (including control and abatement through the exercise of any of the FAA's regulatory authority over air commerce or transportation or over aircraft or airport operations) as EPA determines is necessary to protect the public health and welfare. The FAA shall consider such proposed regulations submitted by EPA under this paragraph and shall, within thirty days of the date of its submission to the FAA, publish the proposed regulations in a notice of proposed rulemaking. Within sixty days after such publication, the FAA shall commence a hearing at which interested persons shall be afforded an opportunity for oral (as well as written) presentations of data, views, and arguments..."

V. THE CRITICAL ASSESSMENT-PLANNING TASK: EVALUATING THE
SOCIAL BENEFIT OF NOISE ABATEMENT

The two preceding sections have touched briefly on the extent to which the noise factor has been considered in the planning of transportation systems as reflected by actions of various legislative and regulatory entities at the Federal, regional, state and local levels. Such actions represent primarily the prescribing phase of the public decision process rather than the preceding assessment/planning phase. Surely, if the program planning phase, supported by an anticipatory project assessment component, has any vital relevance to the effective public decision process, it should influence the prescribing phase either at the legislative or regulatory level or both. Hence, one of the critical questions relates to the extent to which the available hard, "demonstrable data" (concerning such factors as technological feasibility, economic costs, degree of safety provided, social behavioral patterns, etc.) associated with and offered in support of recommended noise emission standards actually support such standards to the satisfaction of the responsible legislative or regulatory body. Noise standards reflect, in part, a normative or social value judgment by the prescribing entity, presumably determined to be in the public interest. Therefore, the task of evaluating the social impact of identified noise effects in particular contexts or in similar patterns of noise intrusion contexts cannot be escaped. Put otherwise, how much is it worth to reduce the noise level by so many decibels within a given period of time? This question has many variations depending upon the specific decisional context. It is submitted that this is the crucial question for the adjudicating or prescribing

entity; it is also the crucial question for transportation systems planners if the latter expect to influence the standards prescribing entity.⁸⁵

This paper has not attempted to address the question of means by which the social impact of noise effects can be evaluated. It has attempted merely to describe some of the more significant statutory schemes which require that noise effects be taken into account in transportation project planning and to note certain judicial decisions as well as state and local actions (both governmental and proprietary) which undertake to cope with the consequences of existing and prospective operational effects of aircraft noise. Evaluation of the social impact of noise effects in connection with anticipatory project assessments of transportation proposals presents a complex and difficult analytical task. The OST RECAT Report stated in this connection:

1. Despite the evident desirability of abatement of vehicular noise, at this time neither the costs nor the benefits associated with various levels of noise reduction have been quantified. As a consequence the relationship between benefit and cost as a function of noise emission is not established, and rational determination of ultimate noise-reduction goals is not possible. If noise-control regulations are not to produce arbitrary and costly constraints on motor vehicle design, studies that will provide a basis for regulation must be carried out to determine

⁸⁵In this connection the discussion of the need to directly relate overall planning to local conditions by George C. Hemmens in Urban Development Modeling (1970), at pages 28-32 is instructive. In this paper Professor Hemmens states: "In short, there was a chasm between the planning process and the decision process." (p. 28) (Monograph No. 6 of the Program of Policy Studies in Science and Technology, The George Washington University.)

the economic costs and the benefits associated with attaining various levels of noise emission.⁸⁶

⁸⁶Cumulative Regulatory Effects on the Cost of Automotive Transportation (RECAT), Office of Science and Technology, February 28, 1972, at 85. Also see EPA Report, *supra* note 27, at §2.4.2(E). See also Mayo, "Some Prospective Implications of Federal Noise Emission Standards on State/Local Noise Regulation," in Selected Papers from the Washington Hearings on Noise Abatement and Control, U.S. Environmental Protection Agency, November 9-12, 1971. One of the critical difficulties with even systematic efforts to abate or regulate environmental noise is the lack of an agreed upon "community noise measure." See Request for Proposal No. DOT-OS-20103 of March 6, 1972, which states in part:

I. INTRODUCTION

In recent years, a number of investigators have worked toward the development of an adequate method of describing "community noise." These studies have lead to measures such as CNEL, CNR, NEF, TNI, NPL and countless others. The number of measures available is symptomatic of the problem that exists; the lack of a single one which is applicable to any study of noise in a community.

The abundance of "special purpose" measures of community noise follows from the same approach which has lead to the large number of methods of characterizing aircraft noise. (See the attached bibliography for a partial listing of studies and reports.) In most instances of both aircraft and community studies a measure resulted from a sequence resembling the following:

1. A particular noise source is identified as a major cause of disturbance. (Aircraft, automobile traffic.)
2. Methods are developed to describe in quantitative terms the physical characteristics of the sounds.
3. Subjective evaluations are based on surveys, laboratory research, available literature and/or expert judgments.
4. In community noise studies, noise contour maps are drawn indicating areas impacted by the major noise source being investigated taking into account variables such as the characteristics of the noise source, the total number of events, reaction of people to these or "similar" noises. The variety of such maps reflect the interests of particular investigators and the problems they address.

These efforts appear to be directed more and more toward quantification and a progressive sophistication of methods of describing the noise within a given physical boundary. However, the primary purpose for developing community noise measures has been obscured.

However, as emphasized above, this task must be confronted if the establishment of noise emission standards and the selection of appropriate noise abatement programs are to be approached on a deliberate, rational basis. While the RECAT judgment on the infeasibility of evaluating the social impact of noise effects may have been justified within the context of that particular study, it does not accurately reflect the analytical situation in all noise abatement decisional contexts.⁸⁷ Further, it is to be noted that S 102(2)(B) of NEPA directs that agencies develop methods, procedures and techniques

. . .which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations. . .

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HOW DO THESE NOISES AFFECT THE PEOPLE PERFORMING THEIR NORMAL FUNCTIONS WITHIN THE COMMUNITY?

If this is the real question to be answered, then the focus of attention becomes the person rather than an area or a particular single type of source, and noise contours should be drawn primarily to indicate and quantify the noise exposures that a person encounters throughout the day (week, year) and how these noises are experienced - interrupted conversations, loss of sleep, etc. Of critical importance is to make measures where noise is experienced, whether indoors or outdoors, at home or at work, while travelling or during recreational activities. Since measures are to be applicable generally, there shouldn't be any pre-suppositions about major noise sources or particular community sizes to be sampled. Non-urban as well as inner city areas should be included in any sampling program.

⁸⁷See, for example, Town of East Haven v. Eastern Airlines, Inc., 333 F. Supp. 338 (1971), wherein it was held that there was compensable "taking" by the city of New Haven, the owner and operator of the airport, but not by the airlines, of a permanent easement with respect to homes over which the aircraft passed or very nearly passed several times a day at an altitude of less than 500 feet, but that there was no "taking" of other properties which were subject only to occasional overflights or to noise, soot, and fumes.

The social impact evaluation of environmental noise effects or in the alternative, the social impact (benefit) of noise abatement programs would seem to be a prime candidate for such attention.⁸⁸ Aspects of this analytical/evaluative task have been treated elsewhere by the author in a recent paper.⁸⁹

The importance of the task of social impact evaluation of noise effects justifies a few additional comments for emphasis. Another way of posing the task of evaluating the social impact of noise effects is to ask: how can available scientific, technological, economic, and social behavioral data and analyses be applied by the assessment/planning entities so as confidently to establish the parameters within which realistic noise reduction goals, regulations, and standards can be prescribed? Acknowledging that heated disputes often arise over the validity of even so-called "scientific" data, there would seem to be, nevertheless, a considerable reservoir of consensus data and analyses concerning what is practicable with respect to noise abatement within given periods of time, the economic costs of alternative abatement strategies, and what the socio-political

⁸⁸ Numerous efforts have, of course, been made to develop evaluative techniques for measuring social impact of noise and to actually perform social cost/benefit assessments of particular proposals. Recent instances involving such analytical/evaluative efforts include the FAA's consideration of the "retrofit" of pre Part 36 types of jet aircraft, Noise Control Report, August 7, 1972, p. 72; a DOT study to analyze relative costs and benefits of alternative methods of reducing commercial aircraft noise, Noise Control Report, October 16, 1972, p. 126; and the Third London Airport study mentioned in Note 79, supra.

⁸⁹ See Mayo, Social Impact Evaluation (Program of Policy Studies in Science & Technology of The George Washington University, Occasional Paper No. 14 of November, 1972).

effects will be. Therefore, the question may be asked: how far have we moved toward the application of available data and analyses in the setting of noise standards, thereby eliminating a corresponding degree of needless and obfuscating partisan contentiousness? Hopefully, we are making some progress. This is not said to denigrate adversarial system. Judgments pertaining to the social impacts of various noise effects and the manner in which the costs and benefits of noise abatement programs are to be shared are matters which properly fall within the ambit of adversarial process.⁹⁰ Judgments on such matters as these involve alternative concepts of social justice (Scheme of Social Values and Relative Weights), and the application of such concepts in specific assessment/decisional contexts constitute appropriate subjects for competing views in the public decision process.⁹¹

One further point of considerable importance needs to be made. While at some point in time the responsible prescribing entity must accept an anticipatory assessment outcome (however arrived at) and a planning strategy for implementation based thereon, this should not be the end of the matter. After all, the objective is to achieve prescribed environmental noise reduction. But in order to determine if the actual noise levels of target sources or environments are in fact being reduced, all Federal, State and local noise abatement programs must be monitored and evaluated on a continuing basis so that modifications, as necessary, can be introduced into these programs periodically. Effective noise abatement involves a continuing evaluative function - not simply a "one shot" decision.

⁹⁰ Mayo, Scientific Method, Adversarial System, and Technology Assessment (The George Washington University: Program of Policy Studies in Science and Technology) Mon. No. 5, November 1970.

⁹¹ See Note 89, supra.

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16. Abstracts The purpose of this paper is to explore the extent to which governmental entities have given consideration to environmental effects (primarily noise) in transportation systems planning. The planning function is discussed in terms of the analytical framework of anticipatory project assessment. Special aspects of two transportation modes are given attention: 1) The consideration of environmental effects in the development of the Interstate Highway System and automotive vehicles; and 2) The evolution of the regulatory structure relating to aircraft noise. The discussion is focused primarily at the Federal level with attention given to the National Environment Policy Act of 1969 and other relevant legislation including S 128 and S 138 of the Federal-Aid Highway Act of 1968, S 136(h) and 136(i) of the Federal-Aid Highway Act of 1970, and S 611 of the Federal Aviation Act of 1958 (1968 amendment). It is noted that only in recent years has serious regulatory attention been given to the transportation noise problem. Some implications of the Noise Control Act of 1972 are suggested. The question of the social impact evaluation of environmental noise is also briefly considered.			
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